



Serial No. 09/811,666
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Response
8/19/03
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of : Mail Stop AF
Ki-whan Song : Group Art Unit 2811
Serial No. 09/811,666 : Examiner Nitin Parekh
Filed March 20, 2001 :

BALL GRID ARRAY PACKAGE SEMICONDUCTOR DEVICE HAVING IMPROVED
POWER LINE ROUTING

**REQUEST FOR RECONSIDERATION
AFTER FINAL**

U.S. Patent and Trademark Office
2011 South Clark Place
Customer Window, Mail Stop AF
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

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Sir:

This is in response to the final Office Action dated June 12, 2003.

Claims 1-4, 11, 14 and 15 were rejected under 35 U.S.C. ¶103 as being unpatentable over the admitted prior art (APA) in view of Masakuni et al. (JP 10-284678). Claims 12 and 13 were rejected under 35 U.S.C. ¶103 as being unpatentable over the APA in view of Masakuni et al., Stearns et al. (US 5895967) and Kirkman (US 6064113). However, Applicants respectfully contend that Claims 1-4 and 11-15 clearly define over the cited references, and in view of the following representations, reconsideration of the rejections under 35 U.S.C. ¶103 is requested.

At page 10 of the Office Action, the Examiner states:

“Applicant contends that Masakuni et al. teach using the stripped conductive pattern on the signal plane and not that having two-dimensional area on the substrate surface as claimed. However, as explained above, Masakuni et al. teach show a variety of signal patterns/planes (Drawings 2, 9, 14, 17, etc.) being configured extending in length/width direction occupying the two-dimensional area on the substrate surface.”

Similarly, at page 4 of the Office Action, the Examiner states:

“Masakuni et al. teach a substrate ... comprising a signal plane in a rectangular/two-dimensional configuration (5c in Drawing 2, 14-18, 1-18; English translation – sec. 0040) where the signal plane is divided into two planes having two-dimensional areas including a first and second planes (5c-1 and 5c-2 in Drawing 2, 14-18, etc.) ... ”

Applicants of course agree that the stripped conductive patterns 5c-1 and 5c-2 Masakuni et al. occupy a two-dimensional area on the substrate surface.

However, the Examiner appears to have overlooked a salient feature of the now claimed invention. In particular, attention is directed to the following limitations appearing in Claim 1:

- a first signal line plane extending over a first two-dimensional area of the second surface of the substrate on one side of the slot;
- a second signal line plane extending over a second two-dimensional area of the substrate;
- a first plurality ball mounts located within the first two-dimensional area of the first signal line plane;
- a second plurality of ball mounts located within the second two-dimensional area of the second signal line plane;

Referring, by way of example, to FIG. 3A of the present application, the ball mounts are located within the two-dimensional area of the signal line planes 262 and 264.

In contrast, there are no ball mounts whatsoever located within the two-dimensional areas of the stripped conductive patterns 5c-1 and 5c-2 of Masakuni et al. Further, there is no teaching or suggestion in any of the references of record which might somehow motivate one of ordinary skill to expand the width of the stripped conductors 5c-1 and 5c-2 of Masakuni et al. so as to completely surround the adjacent ball mounts.

Claim 1 also includes the following limitations:

a first plurality of balls respectively mounted within the first plurality of ball mounts, wherein some of the first plurality of balls are electrical connected to the first signal line plane and others of the first plurality of balls are electrically isolated from the first signal line plane;

a second plurality of balls respectively mounted within the second plurality of ball mounts, wherein some of the second plurality of balls are electrical connected to the second signal line plane and others of the second plurality of balls are electrically isolated from the second signal line plane;

Referring again, by way of example, to FIG. 3A of the application, balls are mounted within the two-dimensional area of the signal planes 262 and 264, where some of the balls are connected to the signal planes, and others are isolated from the signal plane.

Neither the APA nor Masakuni et al., nor the remaining references of record, teach or suggest the placement of ball mounts within the two-

dimensional area of a signal line plane, and the placement of balls on the ball mounts where some of the balls are connected to the signal planes, and others are isolated from the signal planes.

For at least the reasons stated above, Applicants respectfully contend that Claim 1, and the Claims 2-4 dependent thereon, define over the cited references.

Independent Claim 11 includes the following limitations:

a power plane extending over a first two-dimensional area of the second surface of the substrate on one side of the slot, the power plane including power ball mounts, power balls and the power pads;

a ground plane extending over a second two-dimensional area of the second surface of the substrate on one side of the slot, the ground plane including ground ball mounts, ground balls and the ground pads; and

a plurality of signal ball mounts located within and electrically isolated from at least one of the first and second two-dimensional areas of the power plane and the ground plane, respectively;

As discussed above, neither the APA nor Masakuni et al., nor the remaining references of record, teach or suggest signal ball mounts located within and electrically isolated from at least one of the first and second two-dimensional areas of the power plane and the ground plane. For at least this reason, Applicants respectfully contend that Claim 11, and the Claims 12-15 dependent thereon, define over the cited references.

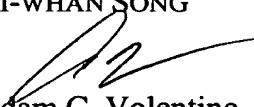
Conclusion

No other issues remaining, reconsideration and favorable action upon the elected Claims 1-4 and 11-15 now-pending in the application are requested.

Respectfully submitted,

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